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APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTY. DOCKET NO.
09/087,136	05/28/98	HORVITZ	H 01997/202002

EXAMINER

HM12/1013

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ART UNIT	PAPER NUMBER
1642	11

JOHNSON, N

DATE MAILED: 10/13/99

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

☒ Responsive to communication(s) filed on 7/26/99

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), ~~or thirty days,~~ whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-33 is/are pending in the application.
Of the above, claim(s) 2, 8-9, 19-24, 26-33 is/are withdrawn from consideration.
☐ Claim(s) _____ is/are allowed.
☒ Claim(s) 1, 3-7, 10-18, 25 is/are rejected.
☐ Claim(s) _____ is/are objected to.
☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
☐ The specification is objected to by the Examiner.
☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.
☐ received in Application No. (Series Code/Serial Number) _____.
☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of Reference Cited, PTO-892
☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 6-filed 12/14/98
☐ Interview Summary, PTO-413
☐ Notice of Draftperson's Patent Drawing Review, PTO-948
☐ Notice of Informal Patent Application, PTO-152

--SEE OFFICE ACTION ON THE FOLLOWING PAGES--

★ U.S. GPO: 1998-421-632/40206

1. Please note that the Examiner assigned to your application in the PTO has changed.

2. Applicant's election without traverse of Group I, SEQ ID NOs:1 and 2, in Paper No. 10, filed 7/26/99 is acknowledged.

3. Claims 1-33 are pending.

Claims 2, 8-9, 19-24, 26-33, drawn to non-elected inventions, are withdrawn from examination.

Claims 1, 3-7, 10-18, 25, to the extent they read on LIN-37, SEQ ID NO:1 and SEQ ID NO:2, are examined on the merits.

4. The lined through reference on the applicant's information disclosure statement filed 12/14/98 fail to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609. They fail to include a complete citation of the reference. Applicant is invited to submit complete citation information.

5. The disclosure is objected to because of the following informalities: When the description of a patent application discusses a sequence listing that is set forth in the "Sequence Listing" in accordance with the Sequence Rules and Regulations, reference must be made to the sequence by use of the assigned identifier, in the text of the description of the patent application. The sequences disclosed on p. 22, lines 22 and 24 of the specification lack SEQ ID NO:'s. Appropriate correction is required.

6. Claims 1, 3, 16 and 18 are objected to as not complying with 1.821(d) of the Sequence Rules and Regulations. When the claims of a patent application discusses a sequence listing that is set forth in the "Sequence Listing" in accordance with the Sequence Rules and Regulations, reference must be made to the sequence by use of the assigned identifier, in the claims of the

patent application. In all claims, the recitation :IN-37 lacks a SEQ ID NO:. Appropriate correction is required.

7. Claims 3 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Given the election of LIN-37 and the withdrawal from examination of LIN- 35, LIN-55, LIN-53, LIN-52, LIN-54 and E2F-1, claims 1 and 3 are duplicates.

8. Claims 16 and 17 are rejected under 35 U.S.C. § 101 because the claims are directed to non-statutory matter. Absent a claim limitation such as "isolated" or "purified," the cells as claimed have the same characteristics as naturally occurring cells, *in situ* in *C elegans* and therefore do not constitute patentable subject matter. In the absence of the hand of man the naturally occurring cells are considered non-statutory subject matter. Diamond v. Chakrabarty, 206 U.S.P.Q. 193 (1980).

9. Claims 1, 3-7, 10-18 and 25 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1, 3, 7, 10, 16 and 18 are vague and indefinite in that they are drawn to non-elected inventions (LIN-35, LIN-55, LIN-53, LIN-52, LIN-54, E2F-1, SEQ ID NO:3-16).

Claims 1, 3, 16 and 18 are vague and indefinite in the recitation "LIN-37." This is a laboratory designation. Absent additional identifying physical or functional characteristics, the identity of "LIN-37" is unclear.

Claim 10 is vague and indefinite in the recitation "having about 50% or greater nucleotide sequence identity to." This language indefinite in the absence of a teaching in the specification of the percentage algorithm to use and the parameters to set in the algorithm.

Claim 25 is vague and indefinite in the "SynMuv gene." This is a laboratory designation. Absent additional identifying physical or functional characteristics, the identity of a "SynMuv gene" is unclear.

The recitation "cell proliferation disease" in claim 17 is vague and indefinite. The metes and bounds of what qualifies as a cell proliferation disease is unclear.

10. Claims 1, 3-6, 11-18 and 25 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 25 is broadly drawn to a "gene." The specification describes only the DNA sequences SEQ ID NO:2, 4, 6, 8, 10, 12, 14, 15 and 15. The specification does not describe any of the structural elements of a gene that would encode these various cDNA sequences. For example, the specification does not describe the organization, location or actual DNA sequences of promotor and regulatory regions and introns, all defining elements of a "gene." Thus, one of skill in the art would not understand that the applicant had possession of the claimed invention at the time the instant application was filed.

Claims 1, 3, 16 and 18 are broadly drawn to nucleic acid molecule encoding a SynMuv polypeptide, "LIN-37," and claim 25 is broadly drawn to "SynMuv" gene. The specification teaches only the cDNA sequence (SEQ ID NO:2) that encodes the LIN-37 polypeptide (SEQ ID NO:1) in C. elegans.

In The Reagents of the University of California v. Eli Lilly and Co. 43 USPQ2d 1398 (Fed. Cir. 1997), the description of a single species of rat cDNA was held insufficient to describe the broad genera of vertebrate or mammalian cDNA. Referring to the written description requirement as set forth in Fiers v. Revel, 25 USPQ2d 1601, 1606 (Fed Cir. 1993), the court stated:

> An adequate written description of a DNA "requires a precise definition, such as by structure, formula, chemical name, or physical properties," not a mere wish or plan for

> obtaining the claimed chemical invention ... Accordingly, 'an adequate written description of a DNA requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it; what is required is a description of the DNA itself' (43 USPQ2d at 1404).

The description of a single species of rat cDNA was held insufficient to describe the broad genera of vertebrate or mammalian insulin:

> "In claims to genetic material ... a generic statement such as 'vertebrate insulin cDNA' or 'mammalian insulin cDNA,' without more, is not an adequate written description of the genus because it does not distinguish the claimed genus from others, except by function. It does not specifically define any of the genes that fall within its definition. It does not define any structural features commonly possessed by members of the genus that distinguish them from others. One skilled in the art therefore cannot, as one can do with a fully described genus, visualize or recognize the identity of the members of the genus. A definition by function ... does not suffice to define the genus because it is only an indication of what the gene does, rather than what it is (43 USPQ2d at 1406).

The court continued:

> Thus, ... a cDNA is not defined by the mere name 'cDNA,' even if accompanied by the name of the protein that it encodes, but requires a kind of specificity usually achieved by means of the recitation of the sequence of nucleotide that make up the cDNA. ... A description of a genus of cDNAs may be achieved by means of recitation of a representative number of cDNAs, defined by nucleotide falling within the scope of the genus or a recitation of structural features common to members of the genus, which features constitute a substantial portion of the genus (43 USPQ2d at 1406).

Following these arguments, the instant specification, which sets forth the only one specific cDNA sequence for LIN-37, obtained from C. elegans, does not provide an adequate written description for the DNA molecules as broadly claimed, from any source.

Applicant is referred to the interim guidelines concerning compliance with the written description requirement of 35 USC 112, first paragraph published in the Official Gazette (1214 OG18-1835), also available at www.uspto.gov.

11. Claims 1, 3-6, 11-18 and 25 are rejected under 35 U.S.C. 112, first paragraph, because the specification does not reasonably provide enablement commensurate with the scope of the claims. The specification does not enable any person skilled in the art to which it pertains, or with which

it is most nearly connected, to make and use the claimed invention commensurate in scope with these claims.

Claims 1, 3, 16 and 18 are broadly drawn to "LIN-37." The specification teaches one single LIN-37, that having the amino acid sequence of SEQ ID NO:1 and encoded by the cDNA sequence of SEQ ID NO:2. Absent claim limitations directed at further functional or physical properties of "LIN-37" one of skill in the art can not make and use any LIN-37 other than the one encoded by SEQ ID NO:2 with a reasonable expectation of success and without undue experimentation.

Claim 25 is broadly drawn to a "gene." The specification teaches only various cDNA sequences. A "gene" is art known to have a characteristic genomic structural organization, in addition to the given mRNA (cDNA) sequence that it might encode, such as the organization, location and actual DNA sequences of promotor and regulatory regions and introns. Absent teachings in the specification characterizing this structural organization of the claimed gene, one of skill in the art can not make and use the claimed gene, with a reasonable expectation of success and without undue experimentation.

Claim 25 is broadly drawn to a "SynMuv gene" isolated according to a method comprising; "providing a cell sample," introducing by transformation a "candidate SynMuv gene" into said cell sample, "expressing said candidate SynMuv gene within said cell sample" and "determining whether said cell sample exhibits an altered cell proliferation response," "whereby an altered level of cell proliferation identifies a SynMuv gene." This is broadly interpreted to read on a wide range of cell samples; from bacterial and yeast to C. elegans cells and mammalian tissue culture cell lines. It is noted that any "candidate gene" that results in an "altered level of cell proliferation" is identified as a SynMuv gene. In practice, such a broadly practiced method, the identification of all "genes" that influence cell proliferation in any fashion in any cell type, would yield a tremendous number of "SynMuv gene candidates." It would require undue experimentation of one of skill in the art to go on to identify true "SynMuv" gene candidates. And given, that no useful identifying characteristics that identify the class of molecules "SynMuv"

are set forth, one of skill in the art would not have a reasonable expectation of success in identifying such molecules that belong to the class of molecules, "SynMuv."

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

13. Claims 1, 3, 5, 15 and 25 are rejected under 35 U.S.C. 102(a) as being anticipated by the June 1996 meeting abstract of Lu and Horovitz. Lu and Horovitz discloses a LIN-37 encoding nucleic acid, a vector containing said nucleic acid and genes identified by a rescue method comprising transformation and screening for altered cell proliferation that are the same as that claimed.

14. Claims 1, 3, 5 are rejected under 35 U.S.C. 102(a) as being anticipated by the June 1996 meeting abstract of Ceol and Horovitz. Ceol and Horovitz discloses a cloned nucleic acid encoding the LIN-37 polypeptide that is the are the same as that claimed.

15. Claims 1, 3, 5, 11, 14-16 and 18 are rejected under 35 U.S.C. 102(a) as being anticipated by the May 1997 meeting abstract of Lu and Horovitz. Lu and Horovitz discloses a LIN-37 encoding nucleic acid, including said nucleic acid linked to a cell type specific promotor (col-10) and vectors and cells (embryos) containing said nucleic acid that are the same as that claimed.

16. Claim 25 is rejected under 35 U.S.C. 102(a) as being anticipated by the May 1997 meeting abstract of Ceol and Horovitz. Ceol and Horovitz discloses genes identified by a method comprising "providing a cell sample," "introducing by transformation into said cell sample a candidate SynMuv gene," expressing said candidate SynMuv gene within said cell sample," and

"determining whether said cell sample exhibits an altered cell proliferation response" that is the same as that claimed.

17. Claims 16 and 17 are rejected under 35 U.S.C. 102(b) as being anticipated by Hedgecock, (Genetics 141:989, 1995). Hedgecock discloses a cell (each of six cells" "called vulval precursor cells") which contains the nucleic acid encoding the LIN-37 polypeptide and is the same as that claimed (see p. 989, col.2).

18. Claims 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Maruyama (Gene 120:135, 1992). Maruyama discloses a cell (E coli cells containing a nematode cDNA library, see abstract) that is the same as that claimed in claims 16-18. Within this library would be clones, in the vector λMGU2, that contain the cDNA encoding the LIN-37 polypeptide and are the same as the vector claimed in claim 15.

19. Claims 1, 3, 5, 7, 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Accession Number U00047 (10 May 1994). Accession Number U00047 discloses a polynucleotide sequence that is the same as that claimed.

20. Claim 25 is rejected under 35 U.S.C. 102(b) as being anticipated by pp.296-297 of "Basic Methods in Molecular Biology" (1986). Pages 296-297 discloses a gene identified by a method comprising "providing a cell sample," "introducing by transformation into said cell sample a candidate SynMuv gene," expressing said candidate SynMuv gene within said cell sample," and "determining whether said cell sample exhibits an altered cell proliferation response" that is the same as that claimed. In the instant case, the G418 dominant selectable marker is interpreted to be "a candidate SynMuv gene," as it results in "an altered level of cell proliferation" in transformed cells.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nancy Johnson whose telephone number is (703) 305-5860. The examiner can normally be reached on Monday through Friday from 8:30 am to 6:00 pm. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paula Hutzell, can be reached on (703) 308-4310. Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Fax Center telephone number is (703) 305-3014 or (703) 308-4242. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

Nancy A Johnson
Primary Examiner

October 8, 1999